

Course Code	Course Name	Credits
26BY104	WOOD TECHNOLOGY	04

Course Objectives

- To understand the basic concepts, characteristics, and uses of wood and wood-based industries.
- To study different types of wood and their physical, mechanical, and functional properties.
- To analyze wood–water relationships, seasoning methods, and their impact on wood quality.
- To learn wood preservation techniques, working processes, and methods of improving durability and stability.

Learning Outcomes

Upon successful completion of this course it is intended that a student will be able to:

- Explain the structure, types, and industrial applications of wood.
- Evaluate the physical and mechanical properties of wood for various uses.
- Understand moisture behavior, seasoning techniques, and defect control in wood.
- Apply knowledge of preservation, woodworking, and stabilization methods in practical situations.

Unit 1 - Introduction to Wood and Wood-Based Industries (12 Hrs.)

Definitions, characteristics, and uses of wood, Growth of wood-based industries in India and global scenario. Wood as a raw material for pulp, paper, rayon, and composite wood industries; applications in furniture, bamboo products, sports goods, pencil, and matchstick manufacturing.

Unit 2 – Wood Types and Properties (12 Hrs.)

Wood types: heart wood and sap wood; hardwood and softwood; early wood and late wood. Merits and demerits of wood as a raw material; physical features of wood. Electrical, thermal, and acoustic properties of wood; mechanical properties, tension, compression, bending, shearing, cleavage, hardness, impact and resistance.

Unit 3 – Wood Suitability and Wood–Water Relationship (12 Hrs.)

Wood suitability: Based on physical and mechanical properties such as strength, hardness, and durability. Wood–water relationship: Shrinkage, swelling, and movement due to moisture changes. Moisture concepts: Fibre saturation point and equilibrium moisture content determining moisture balance in wood.

Unit 4 – Wood Seasoning (12 Hrs.)

Wood seasoning: merits, principles and types; air seasoning, kiln seasoning and chemical seasoning. Refractory classes of timbers, kiln schedules, Seasoning defects and their control, Classification of timbers based on durability

Unit 5 - Wood preservation (12 Hrs.)

Principles, need, and types of wood preservatives (water-soluble and oil-based). Methods of preservation: non-pressure (steeping, dipping, soaking, open tank) and pressure methods (full cell and empty cell—Lowry and Rueping). Wood working processes and tools; dimensional stabilization of wood by surface coating, bulking, and resin/polymer impregnation.

Reference Books:

1. Desch, H. E., & Dinwoodie, J. M. (1996). Timber: Structure, Properties, Conversion and Use. Macmillan Press, London.
2. Panshin, A. J., & de Zeeuw, C. (1980). Textbook of Wood Technology. McGraw-Hill, New York.
3. Forest Products Laboratory (2010). Wood Handbook: Wood as an Engineering Material. USDA Forest Service.
4. Kollmann, F. F. P., & Côté, W. A. (1968). Principles of Wood Science and Technology. Springer-Verlag.
5. Browne, F. L. (1958). Theories of the Combustion of Wood and Its Control. USDA Forest Service.